Bottomless beauty

Wetlands project restores habitat at historic park

By Marti Niman

Legend has it that Bottomless Lakes got their name in the 1860s from cowboys on the Goodnight-Loving cattle trail, who tied their lariats together, tossed them in the lakes and never hit bottom.

In all likelihood, the lariats drifted with the underwater currents fed by numerous seeps and springs of the Roswell Artesian Wetlands. This circulating groundwater, traveling eastward from the Sacramento Mountains, dissolved the gypsum and limestone deposits into subterranean caverns that ultimately collapsed to form small lakes. Sometimes the water overflows its borders.

Lea Lake normally overflows with swimmers seeking respite from the desert heat every summer. In 2002, its banks flooded because the two existing culverts were inadequate. Park Superintendent Steve Patterson contacted the Army Corps of Engineers for help with a problem that became an opportunity to do more than simply plug the dike.

"We could restore the wetland, enhance the flow from Lea Lake and alleviate the flooding problem all at once by applying for the Corps' Aquatic Ecosystem Restoration Project 206," Patterson said.

At first glance, the recently restored wetlands area across the highway from Lea Lake appears unremarkable. Upstaged by the Civilian Conservation Corps' meticulous rockwork at the historic Lea Lake pavilion and water tower, the newly carved ponds still show muddy ruts left by heavy equipment. The current view, however, is a promise of a revitalized landscape to come. It is one that will offer home to a wealth of species diversity and associated economic, educational and environmental benefits for the local community and beyond.

Photos: Marti Niman

Overflow from Lea Lake, the largest of several spring-fed lakes that comprise Bottomless Lakes State Park, has been diverted to form a wetland area that benefits native wildlife and plants.

"You have to imagine this area as a solid wall of salt cedar and a bone yard of old pickup trucks and picnic tables," said Patterson, the driving force behind the restoration project. "We started the project in 2002 when sheet flooding was threatening the historic pavilion, water tower, the day use area and parts of the campground."

The Army Corps of Engineers contractor built ponds, straightened the channel, placed a culvert under the highway between Lea Lake and the wetland area and constructed three ponds during the first phase of the project. The water flows through the enlarged culvert under the highway, into the ponds and eastward to the Lea Lake Overflow Wetlands, ultimately joining the Pecos River.

"There is less water loss through evaporation, transpiration and infiltration," Patterson said. "Cutting the salt cedar cut down on transpiration loss."

"The big success of the project is the Pecos sunflower, which now is growing in great abundance in places where it wasn't before," Phillips said. "It needs full sunlight to germinate and the salt cedar was blocking that."

The Pecos sunflower is a more delicate and lacy-looking version of its stout cousin, with lanceolate leaves and multiple small flower heads that dance in the ever-present prairie breezes. A threatened species listed under the Endangered Species Act, this showy plant survives in fewer than two dozen known locations in desert wetlands of New Mexico and West Texas.

"It's great news that the population at Bottomless Lakes State Park is expanding," said Dr. Patricia Zenone, lead biologist for the Pecos sunflower for the U.S. Fish and Wildlife Service. "There are few wetlands where this species still occurs, and this location is important for the conservation of the Pecos sunflower, both regionally and range-wide."

In 2008, the Fish and Wildlife Service designated critical habitat for the Pecos sunflower at Lea Lake, because it was recognized to be an important habitat area that could contribute to the recovery of the species. Under the Endangered Species Act, critical habitat refers to specific geographic areas that contain elements essential for the conservation of a protected species.

The Pecos sunflower can survive a variety of salinity concentrations and water inundation. According to Joel Lusk, U.S. Fish and Wildlife Service biologist, the flower's genome could prove useful for agriculture because of its unique survival capabilities. The wetlands at Bottomless enhance the area for much more than sunflowers. The newly-restored wetlands at Bottomless Lakes State Park form part of the Roswell Artesian Wetlands, along with nearby Bitter Lakes National Wildlife Refuge.

"Wetlands clean waters and make them useable

Photo: Dan Williams

Wetlands are vital habitat for waterfowl and shore birds such as the great blue heron.

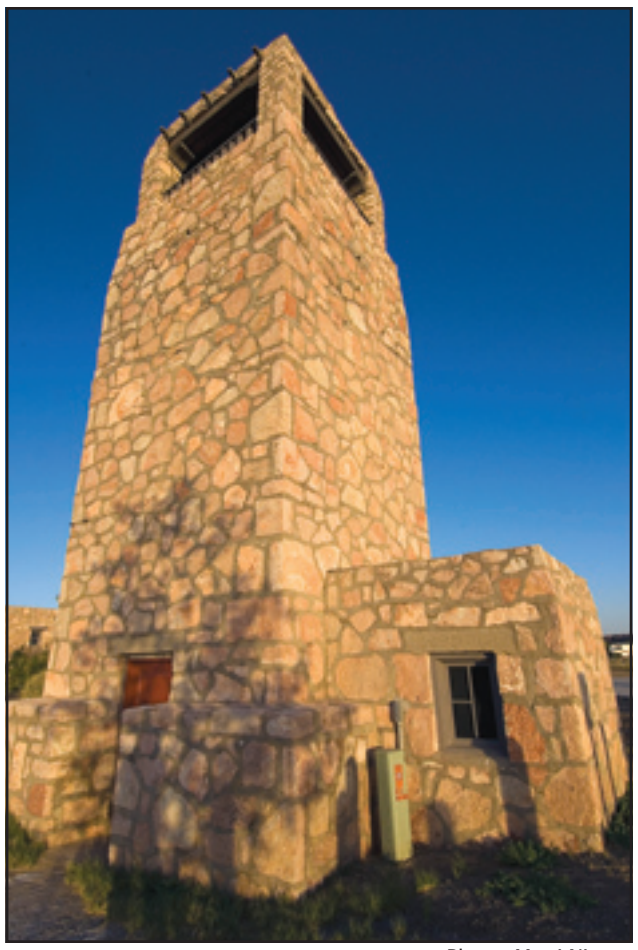

Photo: Marti Niman

The stone tower and bathhouse at Bottomless Lakes State Park were built by the Civilian Conservation Corps in the 1930s.

for agriculture – the water is oxygenated and more life-giving downstream," Lusk said. "The Roswell Artesian Wetlands provide habitat for more than 100 species of dragonflies and damselflies that fly from as far south as the equator as well as numerous rare and unusual species, some of which are found nowhere else in the world."

"Wetlands are one of those habitats that are increasingly rare," Phillips said. "It will be interesting to see what happens with the biological diversity. Plant diversity is rare due to the brackish water; but it is very rich with species of animals."

The brackishness contributes to the wetlands unique character. Some of the distinctive wetland species of the area include a colorful parade of plants and creatures such as the velvet-furred least shrew that thrives in salt grass, the vivid pink-hued Wright's marsh thistle, Pecos muskrat and the exotic-sounding Mexican tetra. The Pecos pupfish is so-named because the male's mating habits resemble puppies at play – and it turns a brilliant neon blue color to lure a mate while making a nest in the shallows.

Photo: Charlie Painter

Terrestrial barking frog

Not to be outdone, the terrestrial barking frog is a sulfurous yellow tropical frog of the family Leptodactylidae that lives underground, emerges after rain and barks like a dog for a mate.

"There also is a very old relict marine specimen of algae there that survives in the sinkholes when drought wipes out populations elsewhere," Lusk said.

The wetlands support all life stages of two springsnail species and an amphipod that are federally listed as endangered and found nowhere else in the world. The arid land ribbon snake, Pecos bluntnose shiner, greenthroat darter and Pecos Gambusia and numerous other rare species call these wetlands home.

"We don't know what their value is yet in terms of economic or medical uses but these wetlands are literally an oasis in the desert," Lusk said.

Wetlands help with flood control, groundwater recharge and capture greenhouse gases. Migratory birds and birdwatchers alike will benefit from this oasis, with numerous species using the area as a stopover.

"East and west from there is a long way from water and the value of wetlands increases with its scarcity," said Steve Cary, natural resources planner for State Parks. "It's important in that part of the state for animals that need aquatic environments and the degree of brackishness adds another variable."

Adjacent to the park the wetlands support thousands of ducks, geese and cranes that start arriving in the wetlands in mid-October, Patterson said.

"I can hear the cranes all the way to the visitor center," he said.

The wetlands also will be good for herons, especially night herons that like thick vegetation, said Rob Yaksich, instructional coordinator for State Parks. "I would expect to see songbirds as well – yellow-breasted chats, blue grosbeaks, indigo buntings in the warmer months, and year-round there likely will be mockingbirds, red-winged blackbirds, spotted towhees and black phoebes."

The impact of birding on local economies is potentially enormous, according to a 2006 survey by the U.S. Fish and Wildlife Service called "Birding in the United States: a Demographic and Economic Analysis." Nationally, birders spent an estimated $12 billion on travel expenses, including food, lodging and transportation, and twice that much on birding-related equipment.

Interestingly, New Mexico ranks with three other states (Hawaii, Vermont and Montana) where more than 45 percent of its birders travel here from out-of-state. The higher the income and educational level, the more likely a person is to be a birder – 29 percent of people from households that earn more than $75,000 annually are birders. While most hunters and fishermen are male, most birdwatchers are female, according to the survey. The wetlands development at Bottomless Lakes includes enhancements for bird watching.

The second phase of the project includes the construction of boardwalks and viewing blinds that allow visitors to walk through the wetlands and observe wildlife and birds close-up. "We get a pretty substantial community of people who are not here for splashing in the lake, they are here for nature," Patterson said. "I can envision them sitting out in the blinds with a book, relaxing."

"The public will walk on the boardwalk through the wetlands that hooks up to an aggregate trail to form a loop," Phillips said. "It should be completed by early 2010."

The viewing blinds are made of salt cedar cut and removed from the site, with a framework of latillas and coyote fencing. The boardwalk ties the blinds together on an elevated deck overlooking the ponds and the Lea Lake Overflow Wetlands beyond. The boardwalk, manufactured in Wisconsin, is shipped down in pieces with parts that snap together like Lego blocks. Made of a composite with an epoxy coating on galvanized steel to deal with the brackish water, the boardwalk is guaranteed to last for life.

"It sits on pads; we didn't want to use concrete," Phillips said. "It will float and as the flow of water changes, it can be adjusted."

The wetlands, boardwalk

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Photos: Marti Niman

Native species such as redwinged blackbirds, the Pecos sunflower and the terrestrial barking frog benefit from a wetlands restoration project at Bottomless Lakes State Park in southeastern New Mexico.

and viewing blinds will provide an excellent educational venue for students of all ages, providing real-life access to an outdoor laboratory like few others in the state.

"One major unforeseen benefit of the wetlands restoration is that it will fit nicely into the Outdoor Classroom Program," Patterson said. "The wetlands will make an excellent outdoor classroom for water-related activities such as chemistry, habitat and hydrology."

A curriculum is in place for use at the wetlands, developed by State Parks and Roswell area teachers as primarily a 4th- and 5th-grade curriculum to address several science standards and benchmarks. Entitled "Bitter Water, Bottomless Lakes: an Outdoor Classroom Program for the Pecos River Basin of Southeastern New Mexico," the curriculum covers five specific areas: "Geology Rocks," "Habitats on the Edge," "Water Ways," "Amazing Adaptations," and "Know Your Place."

"It will give students an opportunity to look at wildlife in the park and understand more about the unique habitat there," Yaksich said. "It also shows the importance of wetlands in a dry state such as ours."

Students study biomes, environmental issues, animal and plant adaptations and other earth science topics, with lessons in the curriculum designed for classroom work before and after the field trips. Some activities have a more specific concentration on the geology, sinkholes and the unique hydrogeology of that part of the Pecos River Basin. State Parks purchased materials and stocked the park with skulls, nets, microscopes, bug boxes and other items to help students do aquatic ecology exploration, including a salinity gauge to measure salinity of soils.

Students who visit the park on a field trip are excited to bring their parents and show them what they have learned, often teaching their parents about stewardship, Yaksich said.

Photo: Charlie Painter
Arid land ribbon snake

The curriculum has some crossover with the Bosque Education Guide designed for the Rio Grande region, but highlights the unique habitat of the lower areas next to the Pecos River, the sinkholes and the fact that there is lots of salt, Yaksich said. "There are lots of halophytes – salt loving organisms such as salt grass, salt bush and salt cedar," he said.

"It's worth mentioning that Steve Patterson is very dedicated to having field trips at the park and he and his staff have long been champions of the Outdoor Classroom Program long before it was a formalized part of State Parks," Yaksich said.

Sandhill cranes, dragonflies and terrestrial ribbon snakes are among many species of wildlife seen at Bottomless Lakes State Park east of Roswell.

Photos: Dan Williams, top and below; Marti Niman, left.

"We are very grateful for their support."

Audubon New Mexico has found a supportive educational environment at the park. In spring 2009, the organization took its popular "Birds of a Feather Explore Together" program into 5th-grade classrooms at Roswell's Washington Avenue Elementary School, said Dana Vackar Strang, environmental education manager.
"This program was in partnership with New Mexico Department of Game and Fish's Share with Wildlife program and Bottomless Lakes State Park," she said.

After classroom work, students participated in a field trip to Bottomless Lakes, where they learned how the study of birds helps scientists understand the relationships between species as an indication of change in an area and overall health of an ecosystem.

Bottomless State Parks was honored this year by colleagues across the state, who voted it as State Park of the Year. The award was well-deserved, as noted by Phillips.

"It has been a pleasure working with the staff at Bottomless Lakes and State Parks in general," she said. "State Parks rocks! They do a lot with a little – with very few resources available in staff or funding."

Excitement over the Bottomless Lakes wetlands project has flowed across national borders as well. The Roswell Artesian Wetlands was nominated as an International Wetlands of Importance under the Convention on Wetlands of International Importance and, at press time, awaits confirmation from headquarters in Gland, Switzerland. The designation is not regulatory and carries no authority, but benefits local communities through heightened scientific awareness, enhanced tourism and ability to secure funding for future projects. If approved, the Roswell Artesian Wetlands would join fewer than 30 in the United States with the designation of International Wetland of Importance.

Photo: Dan Williams

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